

November 2013

Oilsands Transportation Infrastructure

At a glance

Canada's oilsands sector is planning a substantial increase in production in the years ahead. The existing pipeline network is near capacity, so companies have proposed significant new pipeline and rail projects to accommodate the projected growth in oilsands production.

New transportation infrastructure — most notably pipelines, but also rail — makes it possible for oilsands production to grow. Conversely, companies are unlikely to build new oilsands facilities unless they feel confident that they can get their product to desirable markets.

From the Pembina Institute's perspective, the federal government and the Government of Alberta are not adequately managing the environmental impacts of today's oilsands production. Our concerns apply both to the cumulative impacts on the local environment (air, land, water and wildlife) and to the greenhouse gas pollution associated with oilsands production.

Until we have strong enough policies in place to ensure that the cumulative impacts of current and future oilsands production remain below science-based limits, approving transportation infrastructure that enables expanded oilsands production is the wrong choice.

While any transportation initiatives should be required to adhere to the highest safety and environmental standards, no method of transporting crude oil will ever be completely safe. The best way to manage that risk — both for affected communities and for the world's climate — is to reduce the amount of oil we use.

Pembina's approach

The Pembina Institute has a long track record of advocating solutions to advance responsible oilsands development.¹ We work with decision-makers, local communities, the energy sector and many others to advance those solutions.

In our view, responsible oilsands development means that the cumulative impacts of oilsands development remain below science-based limits, both for the regional ecosystem and the global climate.

As a starting point on fulfilling our climate change responsibilities, the oilsands sector should make an adequate contribution to the achievement of Canada's national 2020 emission reduction goal. Responsible development also requires shrinking the environmental footprint of oilsands development for every barrel produced and ensuring a meaningful portion of the benefits of oilsands development are used to support Canada's transition to a clean energy future.

Canada's oilsands industry plans significant growth, but needs affordable transportation options to realize that growth

In 2012, Canada's oilsands sector produced close to 2 million barrels per day. The industry's 2013 production forecast projects close to a tripling of production from that level by 2030.²

¹ For more information, see Pembina Institute, "Oilsands Solutions: Solving the Puzzle," <http://www.pembina.org/oil-sands/solutions>.

² According to the Canadian Association of Petroleum Producers, oilsands production will grow from 1.8 million barrels per day in 2012 to 5.2 million barrels per day in 2030. Canadian Association of Petroleum Producers, *Crude*

But as the Canadian Association of Petroleum Producers' 2013 crude oil forecast notes, crude oil in western Canada "is essentially landlocked and will need additional transportation infrastructure to bring this steadily growing supply to markets." Partly as a result of growth in crude oil production in the United States, which competes for space with oilsands on the existing transportation networks, "additional transportation capacity exiting western Canada will be required by 2014."³

In recognition of the oilsands industry's growth plans, a number of proposals to increase transportation capacity have come forward and are undergoing regulatory review.⁴ The proposals vary in terms of their projected capacity and the access to refineries and markets that they provide, so some have more potential impact on oilsands production than others. However, even if all current pipeline proposals were constructed, they would still be inadequate to achieve the production level that industry forecasts for 2030.

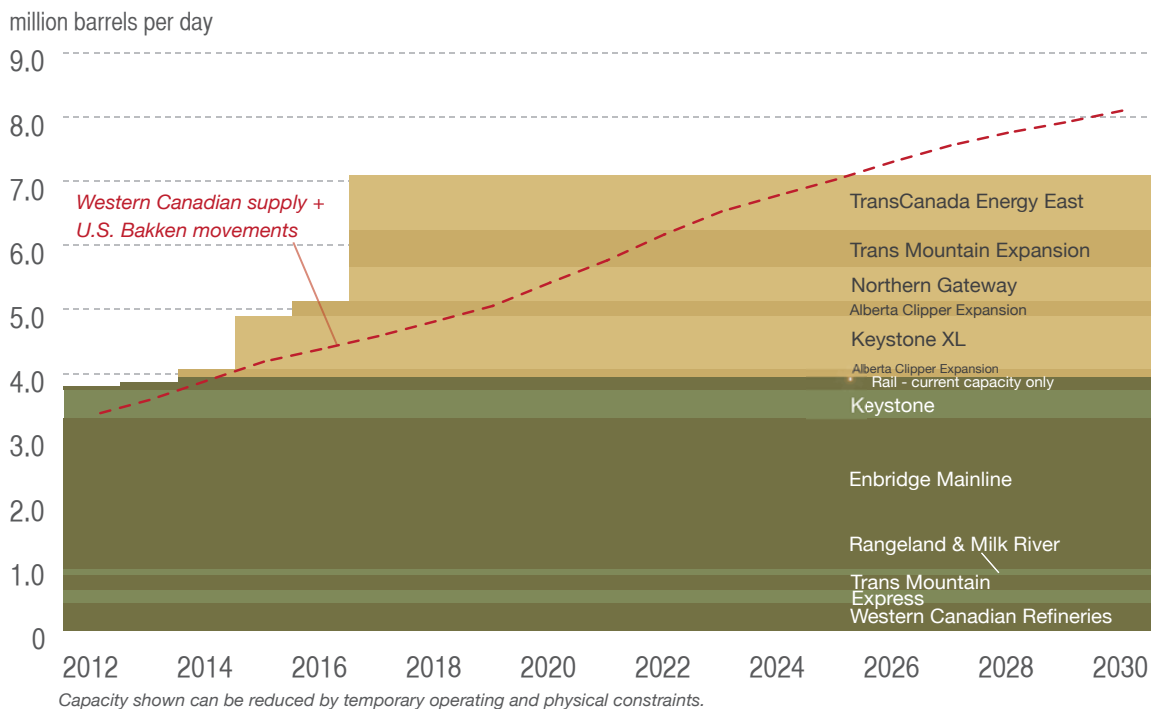


Figure 1. Supply forecast and pipeline capacity

Source: CAPP⁵

Companies and oilsands investors weigh a large number of factors when they make decisions about whether to invest in increasing oilsands production via new projects or expansions. Labour costs, projected future market prices for crude oil products, access to capital, and royalty / tax requirements — to name just a few — are likely to play a role in companies' decision-making.

While these and other considerations influence the pace and scale of oilsands development, it is indisputable that reliable access to low-cost crude transportation out of Alberta makes oilsands

Oil Forecast, Markets and Transportation 2013 (2013), i.
<http://www.capp.ca/getdoc.aspx?DocId=227308&DT=NTV>

³ Ibid., 20 and 31.

⁴ Pipeline proposals currently under consideration include Northern Gateway, Keystone XL, Energy East, Trans Mountain and the reversal of Enbridge's Line 9B.

⁵ *Crude Oil Forecast*, Figure 4.6, 31. CAPP's projection includes both Western Canadian production and U.S. Bakken production that could use part of the same pipeline capacity.

investments more appealing. Conversely, uncertainty about — or constraints on — the future availability of crude transportation would act as a brake on oilsands expansion.

Canada’s governments are not yet adequately managing the impacts of today’s oilsands production

Environmental protection in the oilsands has not kept pace with the growth in oilsands production.⁶ Even at today’s production levels, we are fast approaching the limits of what the region’s ecosystems can bear. Indeed, in cases like nitrogen dioxide emissions, acid deposition levels in local lakes,⁷ or the preservation of woodland caribou,⁸ the impacts of already approved projects will exceed regional environmental limits.

Oilsands production is also Canada’s fastest-growing source of the greenhouse gas pollution that causes climate change. According to Environment Canada, the projected growth in greenhouse gas emissions in the oilsands from 2010 to 2020 is large enough to cancel out all emission reductions that other parts of Canada’s economy are projected to make over the same period. The projected growth in greenhouse gas pollution from the oilsands also is the single largest barrier to achieving Canada’s national 2020 climate target.

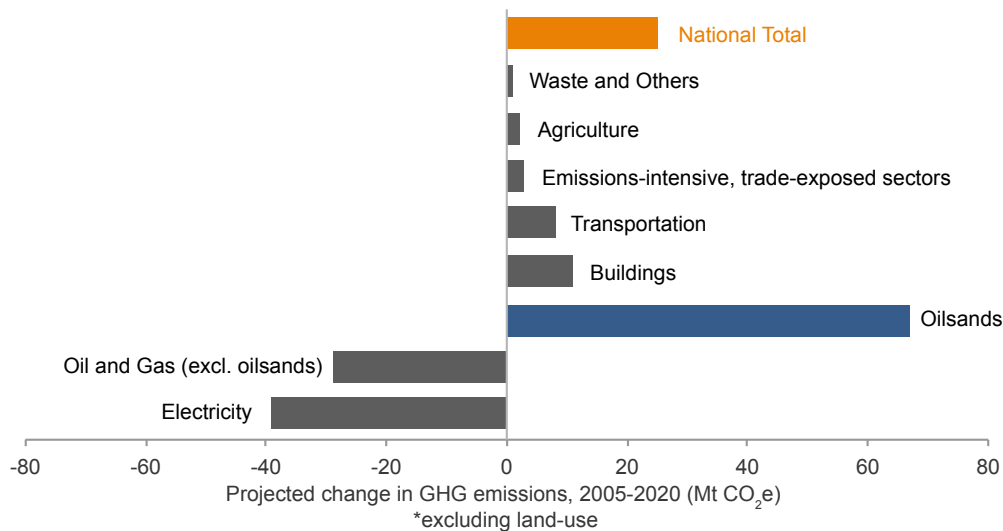


Figure 2. Change in GHG emissions by economic sector, 2005-2020

Data source: Environment Canada⁹

⁶ The Royal Society of Canada’s Expert Panel on the Environmental and Health Impacts of Canada’s Oil Sands Industry discussed the “unprecedented challenge” posed by the “number and complexity of development proposals” in its 2010 report (see Section 5.5.1, available at <https://rsc-src.ca/sites/default/files/pdf/RSC%20Oil%20Sands%20Panel%20Main%20Report%20Oct%202012.pdf>.)

⁷ For a discussion of cumulative nitrogen dioxide emissions and acid deposition from approved oilsands projects, see Sections 5.3.1 and 5.3.2 of the Submission from the Oil Sands Environmental Coalition to the Joint Panel Review Secretariat of the Canadian Environmental Assessment Agency concerning the Jackpine Mine Expansion (available at <http://www.pembina.org/pub/2378>.)

⁸ For example, a Government of Canada briefing note prepared for a February 2012 meeting of federal and Alberta Deputy Ministers (and released under Access to Information legislation) states that “The science is clear — all of Alberta’s boreal caribou are at elevated risk of becoming extirpated (locally extinct), including those in the oil sands region.” Available at <http://www.scribd.com/doc/160797334/Canada-Alberta-oilsands>. The federal government’s recovery strategy for woodland caribou (boreal population) under the *Species at Risk Act* is available at http://www.registrelep-sararegistry.gc.ca/virtual_sara/files/plans/rs_caribou_boreal_caribou_0912_e1.pdf.

⁹ Environment Canada, *Canada’s Emissions Trends 2013*.

<http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=1723EA20-77AB-4954-9333-69D1C4EBD0B2>

At present, neither the Government of Alberta¹⁰ nor the Government of Canada has adopted adequate policies to manage the local impacts of oilsands development or to curtail the sector's greenhouse gas pollution.¹¹

There are solutions available to reduce the environmental consequences of oilsands development

The Pembina Institute has published specific recommendations to help the Government of Alberta¹² and the Government of Canada¹³ adequately address the environmental impact of oilsands production. We have also made recommendations for the design of a federal oil and gas sector greenhouse gas regulation strong enough to help get Canada on track for its national 2020 climate target, which would lay the foundation for greater emission reductions thereafter.¹⁴

At present, there are no federal greenhouse gas regulations in place for the oil and gas sector in Canada. Two years after we recommended a set of 19 policies to help move Alberta towards responsible oilsands development, we have seen substantial progress on two of our recommendations; moderate progress on five; and limited progress on the remaining 12.¹⁵

Our view is that, until governments adopt policies that ensure responsible oilsands development, approving new transportation infrastructure that enables expanded oilsands production is the wrong choice.

Concerns about the transportation infrastructure itself must also be addressed

The Pembina Institute's work on the oilsands sector to date has focused on the "upstream" impacts of this resource's development, meaning the impacts associated with extracting and processing oilsands. In addition to the risks associated with status quo oilsands development, communities along potential oilsands transportation routes, as well as other stakeholders, may also have specific concerns about the risks of moving oilsands products.

Those concerns can include:

- the risks of spills on human health and the environment
- changes in the availability of First Nations' traditional resources, due to the disturbance of wildlife and vegetation during construction and subsequent habitat fragmentation
- the integrity of the infrastructure's design, especially in cases where older pipelines or rail cars are involved

¹⁰ Matthew Bramley, Simon Dyer, Marc Huot, Matt Horne, *Responsible Action?: An assessment of Alberta's greenhouse gas policies* (Pembina Institute, 2011). <http://www.pembina.org/pub/2295>

¹¹ See Clare Demerse and P.J. Partington, *Key issues to watch in federal oil and gas climate regulations* (Pembina Institute, 2013) <http://www.pembina.org/pub/2456> on greenhouse gas emissions and Jennifer Grant, Simon Dyer, Marc Huot and Danielle Droitsch, *Solving the Puzzle: Environmental responsibility in oilsands development* (Pembina Institute, 2011) <http://www.pembina.org/pub/2210> (along with Simon Dyer, Jennifer Grant, *Solving the Puzzle Progress Update 2013* (Pembina Institute, 2013) <http://www.pembina.org/pub/2443>) for a broader set of oilsands environmental management recommendations.

¹² "Oilsands Solutions: Solving the Puzzle."

¹³ Pembina Institute, *Duty Calls: Federal responsibility in Canada's oilsands* (2010). <http://www.pembina.org/pub/2101>

¹⁴ Matt Horne, Clare Demerse and P.J. Partington, *Getting on Track for 2020: Recommendations for greenhouse gas regulations in Canada's oil and gas sector* (Pembina Institute, 2013) <http://www.pembina.org/pub/2427> and *Solving the Puzzle*.

¹⁵ *Solving the Puzzle Progress Update 2013*.

- the greenhouse gas emissions associated with transporting oilsands crude, whether that happens in pipelines, by rail, by truck or by tanker
- the effectiveness and transparency of the government's safety and environmental regulations, monitoring, enforcement and emergency response plans.

We believe that such concerns are valid and must be adequately addressed by project proponents and government regulations, reviews and policies.

It is essential that concerned citizens be granted a fair hearing at regulatory reviews, and that citizens and local governments have timely access to the information needed to keep themselves and their communities safe. The federal government must also fulfill its duty to consult First Nations in good faith.

While any energy transportation initiative should be required to adhere to the highest safety and environmental standards, no method will ever be entirely safe. The safest approach by far — both for affected communities and for the world's climate — is to reduce the amount of oil we use.

We need to make a rapid global transition to clean energy

Like virtually all the world's governments, the Government of Canada has committed to keeping global average warming to below 2°C, relative to the pre-industrial temperature level.¹⁶ Analyses from international expert bodies like the Intergovernmental Panel on Climate Change (IPCC) or the International Energy Agency (IEA) make it clear that status quo development of the world's fossil fuel reserves would put the world on a path for far more than 2°C of global warming — a scenario that risks catastrophic consequences for people, the economy and the environment.

In a world that takes action to avoid dangerous global warming, demand for fossil fuels will fall from today's levels. The IEA's 2013 analysis¹⁷ concluded that the share of fossil fuels in the world's total primary energy demand would fall from 82 per cent in 2011 to 64 per cent in 2035 if countries adopt the policies needed to stay below 2°C of global warming. In that scenario, the world's demand for oil peaks in 2020 and dips to 13 per cent below its 2011 level by 2035.

For the oilsands specifically, the IEA's 2010 World Energy Outlook showed that a far slower rate of oilsands development than current industry projections would be required to stay below the 2°C limit on global warming. Rather than reaching 3.2 million barrels per day (mbpd) in 2020 and 5.2 mbpd in 2030, as the industry's current projections show, the IEA's modelling found that just 2.5 mbpd in 2020 and 3.3 mbpd in 2035 of oilsands production would occur in a world that acts to avoid dangerous climate change.¹⁸

Both the IEA and the IPCC's findings make it clear that the world's fossil fuel reserves contain many times more carbon than we can safely burn.

Avoiding dangerous climate change means that countries like Canada will need to dramatically reduce their emissions over the coming decades. In that context, achieving our national 2020 climate goal — a target that Canada is currently projected to miss by a large margin¹⁹ — must be seen as just a first step in

¹⁶ United Nations Framework Convention on Climate Change, *The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention* FCCC/CP/2010/7/Add.1 (2011), 3. <http://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf#page=2>

¹⁷ International Energy Agency, *World Energy Outlook 2013*, Chapter 2, Table 2.1. <http://www.worldenergyoutlook.org/>

¹⁸ International Energy Agency, *World Energy Outlook 2010*, Chapter 4, Table 4.1. <http://www.worldenergyoutlook.org/>

¹⁹ Environment Canada currently projects that Canada's emissions will be 122 million tonnes above our national target level in 2020. See http://www.ec.gc.ca/ges-ghg/985F05FB-4744-4269-8C1A-D443F8A86814/1001-Canada%27s%20Emissions%20Trends%202013_e.pdf

our transition to a clean energy economy. After 2020, Canada’s greenhouse gas emissions will need to be reduced even further.

Policies like stringent vehicle fuel efficiency standards, new investments in public transit and sustainable transportation, and limits on greenhouse gas emissions from oilsands development are needed to reduce Canada’s emissions and our domestic oil consumption, thus laying the groundwork for Canada to compete successfully in a low-carbon world.

Because Canada is also a significant exporter of fossil fuels — and currently the world’s 10th largest emitter of greenhouse gas pollution in absolute terms²⁰ — we also have a responsibility to take a global perspective. And if we want to avoid the consequences of dangerous climate change, the world needs to use less oil.

As the OECD’s Secretary-General put it in a recent speech, the world needs to move zero net emissions to the atmosphere from fossil fuels in the second half of this century. And in that context, any new fossil resources brought to market “risk taking us further away from the trajectory we need to be on, unless there is a firm CCS [carbon capture and storage] requirement in place or governments are prepared to risk writing off large amounts of invested capital.”²¹

It’s very difficult to make the case that the scale of oilsands development envisioned in industry production forecasts can be reconciled with a credible pathway towards a safe climate. Thus, a project’s compatibility or incompatibility with a low-carbon future should be an important consideration for governments and Canadians as we make public interest decisions about oilsands production and about the transportation infrastructure required to enable the growth of the oilsands sector.

²⁰ World Resources Institute, Climate Analysis Indicators Tool 2.0, <http://cait2.wri.org>.

²¹ Angel Gurría, “The Climate Challenge: Achieving Zero Emissions,” *OECD*, October 9, 2013, <http://www.oecd.org/about/secretary-general/the-climate-challenge-achieving-zero-emissions.htm>